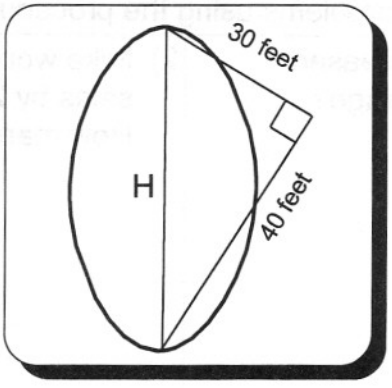
Unit 43 Word Problems Using Algebra and Geometry

1. Jill wants to find the length of her oval swimming pool. She drew the following right triangle and used the Pythagorean theorem to determine the answer.



$H^2 = a^2 + b^2$

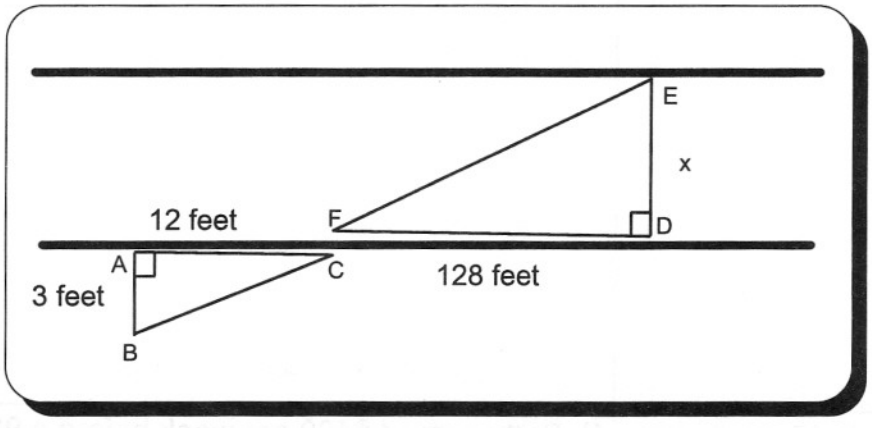
$= 30^2 + 40^2$

$= 900 + 1,600$

$H^2 = 2,500$

$H = 50$ feet

2. John wants to tie a rope across a river. He drew the following similar triangles to determine the river's width.



$\Delta ABC \sim \Delta DEF$

$\frac{AB}{DE} = \frac{AC}{DF}$

$\frac{3}{x} \times \frac{12}{128}$

$3(128) = 12x$

$12x = 384$

$DE = 32$ feet

3. Debbie is 4 times as old as her daughter Pam. In 20 years, she will be twice as old as Pam. How old is Pam?

A. Some difficult problems can be solved by summarizing the data in a box and then writing an equation.
B. Begin by letting x equal the smallest variable, Pam's age now.
C. State her mom's age now.
D. State both ages in the future. (add 20)
E. Write an equation that makes their future ages equal (Pam's age times 2).

Time	Pam	Debbie
Now	x	4x
Future (+ 20)	x + 20	4x + 20

Check your answer

Time	Pam	Debbie
Now	10	40
Future (+ 20)	30	60
Debbie is four times older now. She will be 2 times as old in 20 years.		

$2(x+20) = 4x+20$

$2x+40 = 4x+20$

$2x+40-20 = 4x+20-20$

$2x+20 = 4x$

$2x-2x+20 = 4x-2x$

$20 = 2x$

$x = 10$

Pam is 10 years old.